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ORIGINAL SCIENTIFIC REPORT

# Factors that Can Promote or Impede the Advancement of Women as Leaders in Surgery: Results from an International Survey

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## Abstract

*Background* Compared with male surgeons, women have less success advancing their careers and are underrepresented in leadership positions in surgery. The purpose of this study is to identify the qualifications necessary to become leaders in surgery and the career barriers faced by women surgeons in various cultural environments.

*Methods* A survey was performed with women surgeons in Japan, USA, Finland, and Hong Kong, China, to assess various barriers faced by women surgeons in the respective countries. To develop appropriate survey tool, a preliminary questionnaire was distributed to leaders in surgery and also in various organizations worldwide.

*Results* The response rate was 23 % with 225 of 964 survey returned. Japanese women surgeons identify lacked family support as impeding a successful surgical career. US women surgeons feel more latent gender discrimination. Finnish women surgeons are less likely to need to sacrifice work–life balance, when holding leadership positions. Women surgeons worldwide are highly motivated to develop their career and agree the percentage of women surgeons in leadership positions should be increased.

*Conclusions* Women surgeons in different countries perceive different challenges. We must develop strategies and should not hesitate to negotiate to overcome these issues to reach leadership positions in surgery. This may be accomplished through networking worldwide to improve current conditions and obstacles.

## Introduction

The percentage of women who enter the medical profession and also choose surgery as a specialty has been increasing steadily over time. Despite these increases, women remain underrepresented in leadership positions [1, 2], especially in surgery [3].

To elucidate the reasons for this discrepancy and how we can enhance women surgeons' ability to become leaders, we conducted a study to evaluate the current challenges. In addition, we investigated discrepancies in the views and attitudes toward career advancement and leadership position in different cultural backgrounds.

## Methods

This study was conducted by the Japan Association of Women Surgeons (JAWS) in cooperation with United States of America (US) based Association of Women Surgeons (AWS), the Women's Chapter of the College of Surgeons of Hong Kong (WCHK), and the Finnish Surgical

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Association (FSA) with the approval of the Institute Review Board of the Jikei University School of Medicine.

### Background questionnaire

At initial anonymous questionnaire was sent to active leaders in surgical departments, the leaders of medical organizations pertaining to gender equality, and the heads of business organizations which promote gender equality in Japan ($n = 28$, 17 males and 11 females) and the US ($n = 24$, all females). The questions were open response and asked about key factors for one's career success, factors which promote or impede becoming a leader, the pros and cons of being a woman and a leader, and work–life balance. An abstract with the findings of this questionnaire has previously been published in Japanese [4]. It identified the three most important factors for career advancement: experience, mentorship, and family support. Also noted are three strengths of women surgical leaders: their flexibility, their willingness to be role models, and their ability to alter the perceptions of others through example. The three most barriers for women surgeons were the male-dominated work environment, family responsibilities, and a lack of a mentor. These key themes were extracted and used to create the survey tool.

### Survey tool

During June to August 2013, the survey was distributed to all organization members (JAWS, AWS, WCHK) or chief women surgeons (FSA) either electronically (JAWS, AWS, WCHK) or via mail (FSA). Responses were returned anonymously either via mail or e-mail, and analyzed in a blinded manner.

The first five questions collected demographic information: number of years since graduation, affiliation, position, surgical specialty, and the degree of involvement in major surgical organizations. The subsequent 31 questions (Q6–36) focused on perceptions about career, support, strengths, and weaknesses of women surgeons. We further classified these 31 questions into five categories: determination, support, career aspiration, obstacles, and perceptions about gender discrimination. One question asked participants to quantify their work, family, personal life, and social activity on a 10-point scale. The final three questions were open-ended about important skills and attributes required as a leader, factors for success in leadership, and ways to maintain work–life balance.

### Comparison of Likert scale data

In question 6-36, items were scored on a 5-point Likert scale (1; strongly disagree, 2; somewhat disagree, 3; neutral, 4; somewhat agree, 5; strongly agree). Scores were determined by mean ± SD for each item and the mean scores were compared among the four groups. A radar graph was then created for each of the five categories as mentioned above. Each data point on the radar graph represents the mean for the question and is color coded by country.

### Data analysis

Statistical analysis was performed using JMP version 8.0 (SAS Institute Inc., NC, USA) and SPSS statistics 21 (IBM Corp., NY, USA). The statistical significance of differences between groups was assessed using Mann–Whitney $U$ test. $p$ values $<0.05$ were considered statistically significant.

## Results

### Response rate

In total, there were 225 responses out of 964 requests and the overall response rate was 23.3 %. By country, response rate varied with JAWS, 39.7 % (52/131), AWS, 24.0 % (144/600), FSA 32.3 % (21/65), and WCHK 4.9 % (8/168).

### Respondent characteristics (Table 1)

The number of years since graduation was evenly distributed among AWS respondents. WCHK respondents were all <20 years since graduation, and the majority of the JAWS respondents were <25 years since graduation, while more than half of FSA respondents were between 20 and 29 years since graduation. In total, 60 % of respondents were affiliated with an academic institution, 22 % to a general hospital, 12 % to private practice, and 5 % indicated another affiliation. 63 % of WCHK respondents belonged to a general hospital. As for position, both junior and senior ranks were seen in the AWS respondents, and neither residents nor fellows were present in JAWS and FSA. As previously mentioned, since the survey was sent to chief women surgeons in FSA, 82 % of FSA surgeons were division chiefs (or chairs). Various specialties were represented among respondents in each county and specialties in the "others" category included general surgery, surgical oncology, and plastic surgery.

### Comparison by age (Fig. 1)

As the age distribution of the respondents from each country was different, each question was compared by years since graduation. Overall, the results were similar when stratified by generation. Some of the results are indicated in Fig. 1. Questions to which there was only one response are marked by an asterisk on the bars.

**Table 1** Respondents Characteristics

| | AWS | JAWS | FSA | WCHK |
|---|---|---|---|---|
| Number of years since graduation | | | | |
| <5 | 22 | 1 | 0 | 0 |
| 5–9 | 20 | 11 | 1 | 3 |
| 10–14 | 16 | 16 | 1 | 3 |
| 15–19 | 16 | 9 | 2 | 2 |
| 20–24 | 20 | 11 | 6 | 0 |
| 25–29 | 20 | 2 | 7 | 0 |
| 30–34 | 14 | 1 | 1 | 0 |
| 35–39 | 11 | 0 | 1 | 0 |
| 40< | 5 | 1 | 1 | 0 |
| Affiliation | | | | |
| Academic institution | 95 | 24 | 11 | 2 |
| General hospital | 15 | 20 | 9 | 5 |
| Private practice | 22 | 5 | 0 | 1 |
| Others | 12 | 0 | 0 | 0 |
| Title | | | | |
| Resident/fellow | 30 | 0 | 0 | 3 |
| Graduate school | 0 | 4 | 0 | 0 |
| Lecturer | 2 | 11 | 0 | 0 |
| Assistant professor | 12 | 3 | 0 | 0 |
| Associate professor | 10 | 3 | 3 | 1 |
| Professor | 7 | 0 | 0 | 0 |
| Hospital staff surgeon | 8 | 16 | 5 | 1 |
| Private practice | 13 | 6 | 0 | 1 |
| Division head | 0 | 0 | 7 | 1 |
| Medical director/program director | 1 | 7 | 0 | 0 |
| Others | 3 | 0 | 2 | 0 |
| Specialty | | | | |
| Upper GI | 5 | 3 | 3 | 1 |
| Colorectal | 9 | 4 | 3 | 0 |
| Hepatobiliary | 2 | 0 | 1 | 0 |
| Thoracic | 1 | 3 | 0 | 0 |
| Cardiac | 4 | 2 | 0 | 0 |
| Vascular | 7 | 1 | 1 | 0 |
| Pediatric | 9 | 3 | 2 | 1 |
| Breast/endocrine | 29 | 20 | 2 | 5 |
| Transplant | 2 | 1 | 0 | 0 |
| Trauma/emergency/acute care | 20 | 0 | 0 | 0 |
| Research | 4 | 0 | 0 | 0 |
| Others | 52 | 3 | 6 | 1 |

## Involvement in major surgical organization (Fig. 2)

To understand the degree of involvement in major surgical organizations, we asked whether the respondent was a member of a committee, project, or study group of a major surgical organization. In total, approximately half of women surgeons were involved in major surgical organizations. However, only 15 % of JAWS surgeons were involved in major surgical organizations, and this percentage was less than that of the WCHK surgeons who are of a relatively young age.

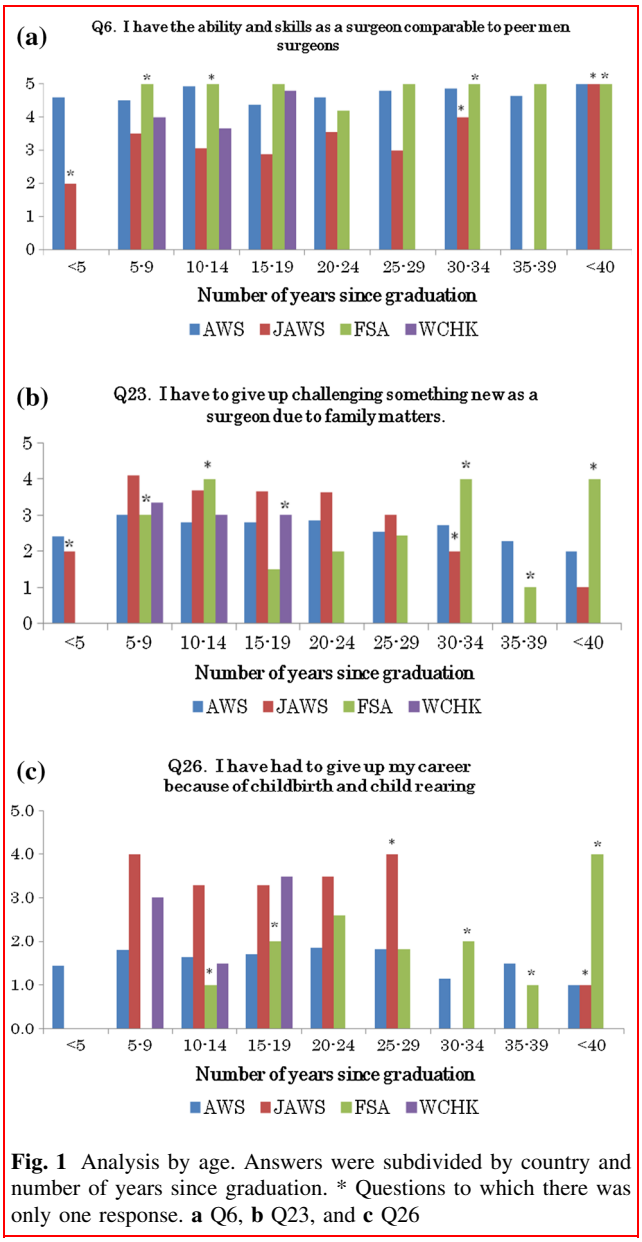


**Fig. 1** Analysis by age. Answers were subdivided by country and number of years since graduation. * Questions to which there was only one response. **a** Q6, **b** Q23, and **c** Q26

## Determination (Fig. 3)

Seven of the questions defining with career pursuit were categorized as determination. In terms of dedication to the pursuit of their careers, women surgeons worldwide were universally determined to pursue their careers. For example, to the question "No matter how hard it would be, I am willing to be participate in the best training program if possible (Q13)" and "Even if there are many difficulties, I would keep going to achieve my goal and dreams in the

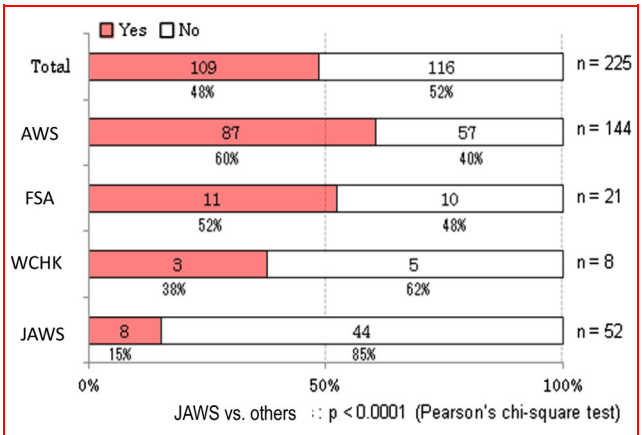


**Fig. 2** Currently I am a member of the committee, project, or study group of a major surgical organization

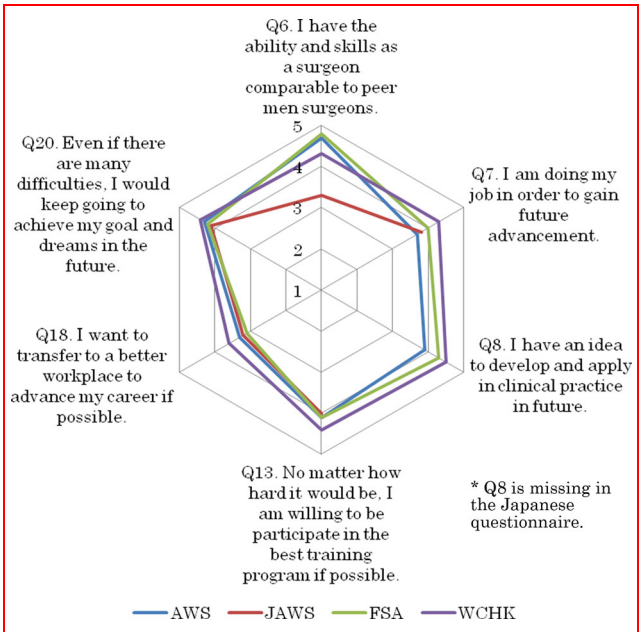


**Fig. 3** Determination

future (Q20)," mean score was 4.4 ± 0.1 and 4.2 ± 0.1, respectively. However, to the question "I have the ability and skills as a surgeon comparable to peer men surgeons (Q6)," JAWS surgeons had notably less confidence about themselves (AWS 4.7 ± 0.8, JAWS 3.3 ± 1.2, FSA 4.8 ± 0.7, WCHK 4.1 ± 1.4, JAWS vs. others, $p < 0.01$).

## Support (Fig. 4)

There were six questions centered on career support. The scores for support from a mentor (Q9) and from female colleagues available to consult (Q10) showed weakness of professional support with the score of 3.0 ± 0.1 and

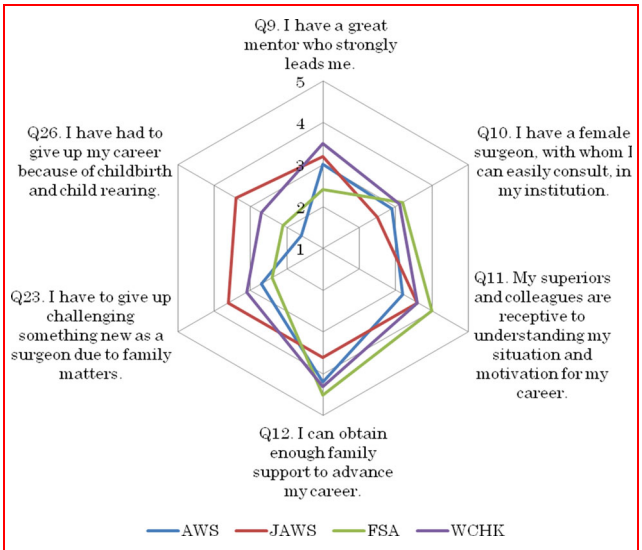


**Fig. 4** Support

2.9 ± 0.1, respectively. There was no difference among each country. Women surgeons in AWS, FSA, and WCHK had great support from their family (Q12); however, JAWS surgeons significantly lacked in family support (AWS, 4.3 ± 1.2; JAWS, 3.6 ± 1.4; FSA, 4.7 ± 0.9; WCHK, 4.3 ± 0.5; JAWS vs. others, $p < 0.01$).

To the question "I have to give up something new and challenging as a surgeon due to family matters (Q23)," JAWS showed a higher mean score than others countries (AWS, 2.7 ± 1.2; JAWS, 3.6 ± 1.4; FSA, 2.4 ± 1.4; WCHK, 3.1 ± 0.7; JAWS vs. others, $p < 0.01$). Also to the question "I have had to give up my career because of childbirth and child rearing (Q26)," JAWS again showed a much higher mean score (AWS, 1.6 ± 1.1; JAWS, 3.4 ± 1.3; FSA, 2.1 ± 1.2; WCHK, 2.7 ± 1.0; JAWS vs. others, $p < 0.01$).

## Career aspiration (Fig. 5)

Six questions related to career aspiration.

WCHK surgeons overall were the most determined to pursue their careers (Q15, 4.1 ± 0.8; Q16, 4.3 ± 0.7; Q17, 4.1 ± 0.6; Q19, 4.4 ± 0.7; Q21, 4.3 ± 0.5) and were the most interested in overseas study (AWS, 3.2 ± 1.4; JAWS, 3.3 ± 1.3; FSA, 3.3 ± 1.4; WCHK, 4.4 ± 1.1; WCHK vs. others, $p < 0.01$). The other three countries showed a more neutral response to international education.

To the question "I want to get a more advanced position to pursue my career (Q19)," surgeons in Finland showed the lowest score (AWS, 3.9 ± 1.2; JAWS, 3.4 ± 1.1; FSA, 2.8 ± 1.4; WCHK, 4.4 ± 0.7).

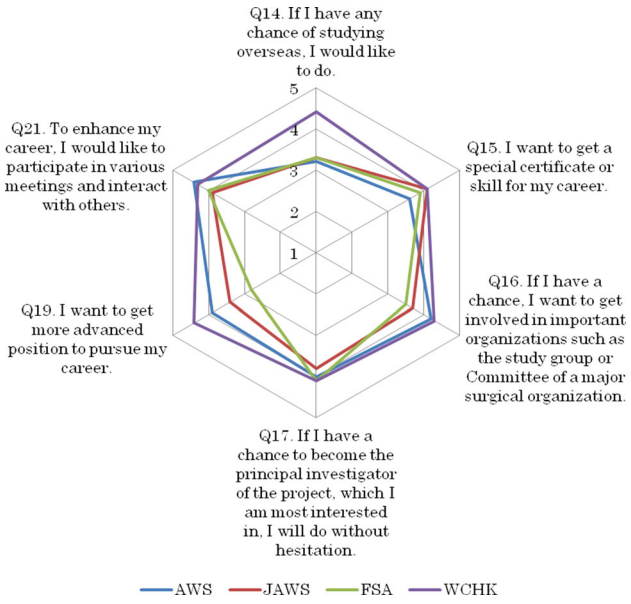


**Fig. 5** Career aspiration

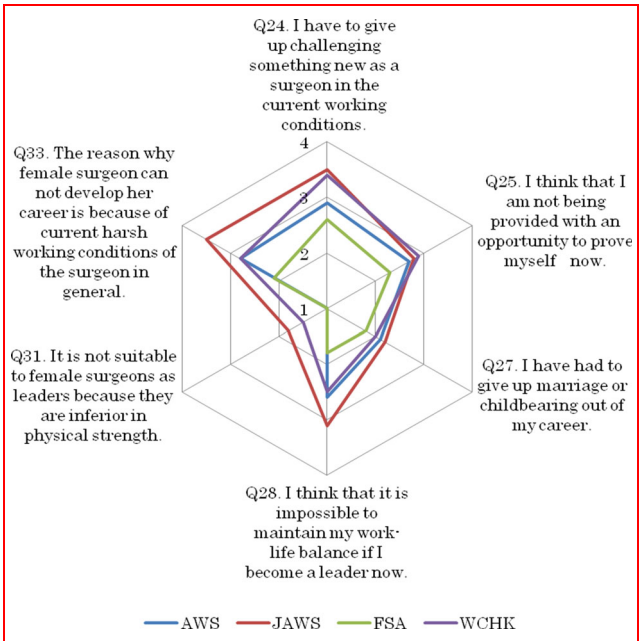


**Fig. 6** Obstacles

### Obstacles (Fig. 6)

Obstacles to career development were the focus of six questions.

Overall, FSA surgeons perceived the least obstacles in their current working conditions (Q24, 2.6 ± 1.4; Q25, 2.3 ± 1.4; Q27, 1.8 ± 1.2; Q30, 1.8 ± 0.9; Q31, 1.0 ± 0.2; Q33, 2.1 ± 1.2). Of note, to the question, "I think that it is impossible to maintain work–life balance if I become a leader (Q28)," JAWS surgeons gave the highest score (3.1 ± 1.1), then AWS (2.6 ± 1.4), WCHK (2.5 ± 1.1), and FSA perceived the least (1.8 ± 1.1).

### Perceptions about gender discrimination (Fig. 7)

Gender discrimination was assessed with seven questions.

Women surgeons worldwide strongly agreed that the "Current rate of female surgeons, who are involved in the governing structure and committee in the institution or surgical society, should be improved (Q35)" with the score of 4.3 ± 0.6. Also, strong agreement was found in all countries to the statement "I do not hesitate to negotiate things in order to improve current inappropriate conditions (Q22)," with the score of 3.9 ± 0.7. To the question "I think male surgeons do not want to work as a subordinate if the boss is a woman (Q30)" and "I think that there is latent discrimination in favor of man with respect of promotion and recruitment (Q32)," AWS surgeons showed a considerably higher score compared with other counties (Q32; AWS, 4.0 ± 1.1; JAWS, 3.3 ± 1.2; FSA, 2.9 ± 1.5; WCHK, 2.8 ± 1.0; AWS vs. others, $p < 0.01$, and Q30; AWS, 3.2 ± 1.2; JAWS, 2.5 ± 1.0; FSA, 1.8 ± 0.9; WCHK, 2.9 ± 1.1; AWS vs. others, $p < 0.01$).

### The ratio of work/family/personal/social activity (Fig. 8)

When the participants were asked about quantify work/family/personal/social activity in their current lives such that a sum of ten was created. We found average score of work (5.6), family (2.4), personal activity (1.2), and social activity (1.0) among all participants. Interestingly, these ratios are almost exactly the same between AWS and JAWS. WCHK women surgeons express less work and more personal/social activities.

## Discussion

In this research, we assessed the attitude about careers, leadership positions, supports, obstacles, and perceptions about the gender discrimination among US, Japan, Finland, and Hong Kong women surgeons. We observed similarities and distinct differences among the four countries.

### Career stage

Residents/fellows were the dominant respondent groups in AWS suggesting that women surgical residents/fellows are seriously invested in their career, potential leadership, and

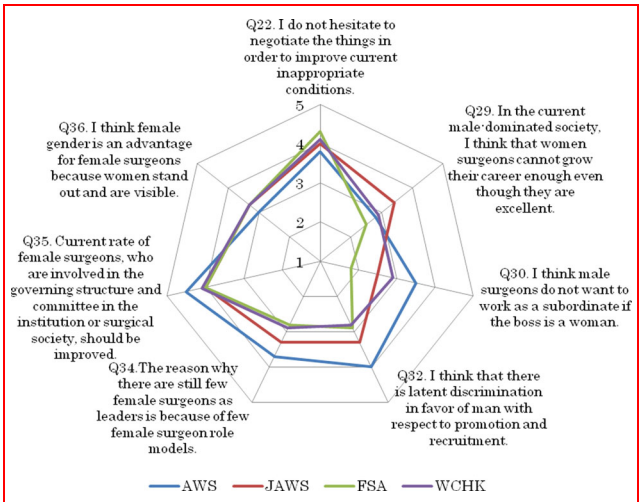


**Fig. 7** Perceptions about gender discrimination

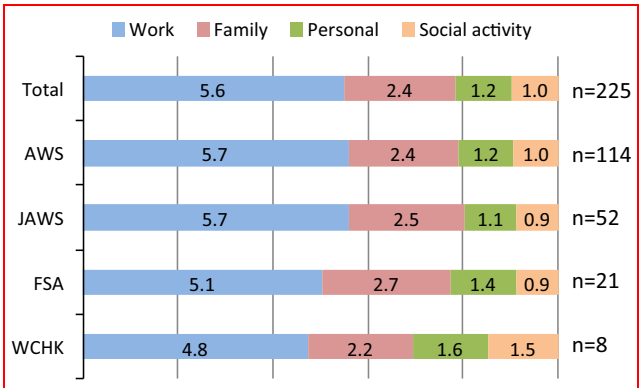


**Fig. 8** Work/family/personal/social activity ratio of a total of 10 in current life

maintaining work–life balance in the US. Indeed, AWS has a Resident & Fellow Committee and the American College of Surgeons has a Resident and Associate Society. Both have been successful in engaging young surgeons in career development at early stage. In Japan, on the other hand, there are no systems like these, leading to a mentorship and leadership gap.

As for surgical specialty choice, almost half of women surgeons in Japan and Hong Kong and one fifth of those in the US select breast/endocrine surgery. These results are consistent with a former study [5] and indicate that breast surgery is the most popular surgical specialty for women surgeons worldwide.

## Determination and career aspiration

Surgery is perceived as a challenging specialty with a difficult life style, thus the number of medical students who choose surgery as a specialty is decreasing especially in developed countries [6, 7].

In the US, the proportion of women medical graduates who choose a surgical career increased significantly over the past two decades [8, 9], and the same tendencies are observed worldwide, including in Japan [10], Nordic countries [11], and Hong Kong [12]. Among US medical students, although both men and women want flexible and protected time for family and friends in their working careers [13], fewer women than men considered practice lifestyle in choosing their medical careers [14]. According to the survey of the members of The Japan Surgical Society conducted in 2008 (JSS survey) [15], 60.3 % of women surgeons in their twenties without children, compared with 52.9 % of those of men, work more than 75 h per week. These results suggest that young women surgeons even work longer hours than men in Japan. Our study and others clearly demonstrate that women surgeons are strongly motivated to pursue successful surgical career, and they do so even though it may impact work hours and life style.

In our study, women surgeons voiced their desire to seek the best training program available in order to achieve their goals and dreams (Q13). Practically though, there are differences among each country. Women surgeons in Hong Kong have the most aggressive approach in terms of career aspirations such as overseas training, promotion, and involvement in major surgical organizations. The same tendencies were observed in the prior study [5], in which women surgeons in Hong Kong showed ambition and determination in their future careers. This observation was supported by the fact that these respondents indicated that their future career path is mapped and understood and they have a clear career plan. The relatively higher percentage of women surgeons in Hong Kong involved in major surgical association, despite their young age (Fig. 2), seems to support this statement.

## Support, challenge, and self-esteem

Although women in medicine are highly motivated toward a professional career, as indicated above, they experience conflict between work and family responsibilities [16, 17]. Women physicians tend to have more family responsibilities and spend longer hours on domestic work. However, these unpaid labors are not considered in assessing work hours [18, 19]. In terms of family support, clear differences were observed between the groups, with much less support of Japanese women surgeons compared with those in other countries (Fig. 3). The JSS survey [15] showed that Japanese women surgeons reported a greater number of hours per day dedicated to house work, averaging 2.6 h for those without children and 4.8 h for those with children. On the

other hand, male respondents on average reported <1 h per day of house work whether or not they had children. This tendency is not limited to the medical profession in Japan. When globally compared the proportion of total time spent on care work (defined as the time spent to care for a child or another adult), the largest difference is recorded for Japan where women spent on average 4 and 6 times more time on care work than men [20]. Women surgeons in Japan therefore have a greater tendency to give up their careers because of child rearing or family matters. Again, the JSS survey [15] clearly showed that the working style of Japanese women surgeons with children was very much different from the others with fewer working hours, less on call, and lower income. These different working styles deprive Japanese women surgeons of a chance to accumulate clinical experiences and academic performances. As a result, they decidedly lack self-esteem as demonstrated in our survey (Fig. 3). In addition, they think that it is impossible to maintain their work–life balance if they become leaders, resulting in decreased pursuit an advanced positions or additional responsibilities (Fig. 5).

A number of reports have noted that women tend to have lower self-confidence than men both in residency [21–23] and in faculty positions [24]. In addition, women were less likely to be interested in obtaining a more advanced degree or position [23]. In this study, we observed clear differences in self-confidence among women from different countries. As this self-confidence is measured by comparing to the peer male surgeons in each country, these differences are not the results of different training systems. They may be due to the different life demands on women surgeons in Japan. As clinical exposure and operative case volumes significantly affect trainee confidence [23, 25, 26], it is important to ensure that women trainees are provided adequate experience in training to obtain confidence equal to that of their male colleagues.

## Gender discrimination

In this study, women surgeons in the US remain concerned about gender bias (Fig. 7), despite their increasing numbers. There have been many other reports from US which pointed out perceived and unconscious gender bias against women surgeons [2, 27–30]. However, a Japanese study also demonstrated that more women physicians reported gender-based discriminations related to professional advancement than men [31]. Perceived gender-based discriminations were seen during medical school, residency, and in practice and significant gender differences were observed in faculty salaries, ranks, tracks, leadership positions, resources, and perceptions of academic climate. Not only did women anticipate or perceive active discrimination in the form of being treated differently and experiencing negative comments about their sex, but also bias against women was associated with less professional support. As females who experience discrimination and less support feel excluded from the dominant culture, the presence of overt and implicit bias results in detrimental effects on career advancement and satisfaction. This feeling of isolation among women surgeons in the US might lead them to seek stronger ties between women leaders and role models through the organization like AWS. This hypothesis is supported by the fact that women surgeons rated the highest scores to the question "To enhance my career, I would like to participate in various meetings and interact with others (Q21)" and "The reason why there are still few female surgeons as leaders is because of few female surgeon role models (Q34)."

## Perceptions about time allocation and dedication to work as a surgeon

In this study, we observed interesting results about women surgeons' daily time allocations. The proportion of work/family/personal/social activity is almost identical between Japan and US women surgeons. Time spent at work is longest for Japanese and US women surgeons. This raises the question of why can Japanese women surgeons not achieve more advanced career success despite long working hours. We hypothesize that it relates to the work environment, including lacked support staff, clinical volume, and diminished domestic assistance. In the JSS survey [15], the greatest impediment to career development was poor working conditions. Also, as indicated in Fig. 6, Q33, Japanese women surgeons report they cannot develop their careers because of the harsh working conditions, in general. In Japan, surgeons provide a comprehensive level of care not seen elsewhere. For example, the surgeon of an oncology patient provides not only the initial diagnostic evaluation and surgical resection, but also the drug therapy including chemotherapy, and even palliative care. In addition, there are very few comedical staffs that assist surgeons. Japanese surgeons report exhaustion because of heavy volume with long working hours. Additionally, women surgeons struggle with the full brunt of domestic responsibilities in a culture where men are not expected to assist in the home. They are left with no time to accomplish the high-level research needed for advancement after struggling through long work hours and their domestic responsibilities. It is imperative to further study and propose solutions to improve working conditions in order to allow women surgeons to advance their professional careers.

## The Finnish model: an ideal world for women?

According to the Global Gender Gap Index 2014 [32], which indicates the relative gaps between women and men

across (health, education, economy and politics), Finland ranks as second best in the world. For comparison, US ranks 20th, China 87th, and Japan 104th. The Nordic countries, Sweden, Norway, Denmark and Finland, have long been known for their gender equality ideologies and practices, and as a result, different types of statutory family-friendly policies have been developed to help parents achieve better work–family balance and shared parenthood [33–35].

Still, despite the ideology of gender equality in Nordic countries, it is said that traditional gender role expectations still hinder men and women from fulfilling equally their roles as worker, parent, and spouse [17, 35]. However, the results of this study clearly show that women surgeons in Finland recognize of the fewest obstacles and the lowest degree gender discrimination. Women surgeons in Finland have the highest score to the question "I do not hesitate to negotiate the things in order to improve current inappropriate conditions (Q22)." Even in the favorable status compared with others, women surgeons can continue to seek improvements in their workplace. Interestingly, a study showed that the majority of men surgeons in Hong Kong agreed with the necessity for granting paternity leave [36]. Encouraging men worldwide to participate in a more equitable sharing of domestic work and child rearing in order not only to gain understanding, even better, support for women surgeons and allow men to more fully appreciate this important life experience.

## Weak points and limitations

Like many survey-based studies, our research has some limitations.

First, response rates are lower than desired, especially for women surgeons in Hong Kong. This same population of women surgeons was surveyed previously and the response rate was also low (25.3 % [5]). Additionally, other surveys performed in Hong Kong showed similar tendencies, thus it is not unique to our study [12, 36]. Another possible reason is that the number of women surgeons in Hong Kong who is struggling between work and childrearing may be few. Unlike the US and Japan, surgeons can have live in helpers so even for child bearing working women get a lot of help for family chores [37]. Even if not, as Hong Kong is a rather small place and parents and relatives live at close distance, it is not unusual that grandparents also spend time helping working daughters to look after their children.

Second, distribution of respondents' age and rank vary among the different countries. These factors may create a certain bias in the responses. Our survey was limited to women surgeons who belong to specific organizations which may exclude the voice of women surgeons who choose not to belong to these. Despite different age and rank, all respondents expressed almost identical aspirations about their career. Additional analysis by age does not show differences in these groups, though subgroup analysis seems not suitable because of the small number of participants. Additional larger studies would be ideal to fill in any gaps created by low response rates.

## Conclusions

Our study outlines the current conditions and concerns of women surgeons in a variety of different countries. We identified similarities in motivation and determination to succeed, as well as differences in the quality of life and support for success in different environments. While women surgeons continue to increase in number, there continues to be a leadership and advancement gap requiring attention. We hope this survey will spur worldwide discussion on how our profession can enhance this important facet of our work pace. Surgeons worldwide have a responsibility to overcome latent and overt gender bias through open discussion, creations of policy, development of network, and enhance of inappropriate work conditions that impede a gender-free work–life balance.

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